Modeling psychiatric disorders at the cellular and network levels.

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Public Summary:
Psychiatric disorders such as autism spectrum disorders, schizophrenia and bipolar disorder affect many brain regions and produce a complex array of clinical symptoms. The defects that contribute to these diseases at the the level of single cells and simple networks remain unknown. New laboratory techniques make it possible to study these diseases by inducing neurons artificially from patient fibroblasts. It is now possible to generate limitless numbers of live human neurons from patients with psychiatric disorders. We predict that these studies will ultimately contribute to our understanding of the initiation, progression and treatment of psychiatric disorders.

Scientific Abstract:
Although psychiatric disorders such as autism spectrum disorders, schizophrenia and bipolar disorder affect a number of brain regions and produce a complex array of clinical symptoms, basic phenotypes likely exist at the level of single neurons and simple networks. Being highly heritable, it is hypothesized that these disorders are amenable to cell-based studies in vitro. Using induced pluripotent stem cell-derived neurons and/or induced neurons from fibroblasts, limitless numbers of live human neurons can now be generated from patients with a genetic background permissive to the disease state. We predict that cell-based studies will ultimately contribute to our understanding of the initiation, progression and treatment of these psychiatric disorders.Molecular Psychiatry advance online publication, 3 April 2012; doi:10.1038/mp.2012.20.